EUROCONTROL

FAA/EUROCONTROL: Action Plan 5

Operational Concept Validation Strategy Document
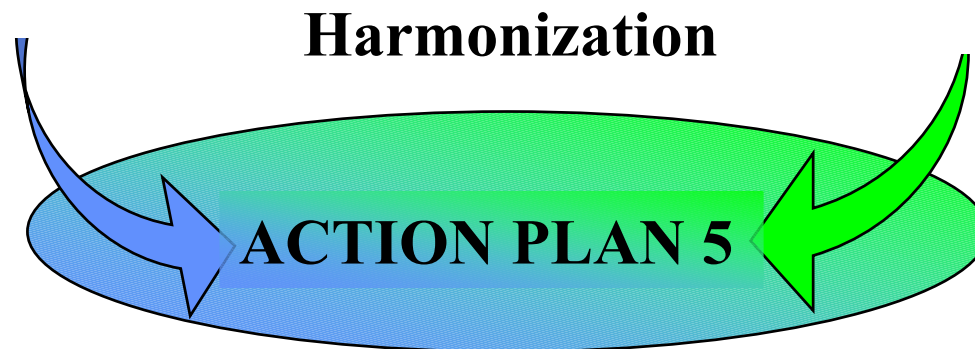
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19th March, 2002

HISTORY

EATMS Validation Strategy Document (as part of EATCHIP)

Operational Concept Validation Process

Harmonization

ACTION PLAN 5

Operational Concept Validation Strategy Document

-Establishes a common understanding of the context, purpose, and scope of validation

-Presents a set of general principles underlying the approach to be taken

Operational Concept Validation Strategy

- **Establishes a shared definition of validation,**
- **Pools expertise and promotes best practices,**
- **Establishes means for sharing assumptions and results,**
- **Promotes reuse of tools and analyses,**
- **Builds acceptance by controller and pilot,**
- **Builds confidence in the related decision, and**
- **Supports consensus across the communities.**

DEFINITIONS

Validation:

- **"The process through which a *desired level of confidence* in the ability of a deliverable to operate in a real-life environment may be demonstrated against a pre-defined level of functionality, operability and performance."**

Have we built the right system?

Verification:

- **"The process of evaluating the products of a given *system development activity* to determine correctness and consistency with respects to the products and standards provided as input to that activity. "**

Have we built the system correctly?

DEFINITIONS

Certification:

- **"The process aiming at the satisfaction of an authority that a deliverable complies with a set of regulations, in order to ensure its proper operation."**
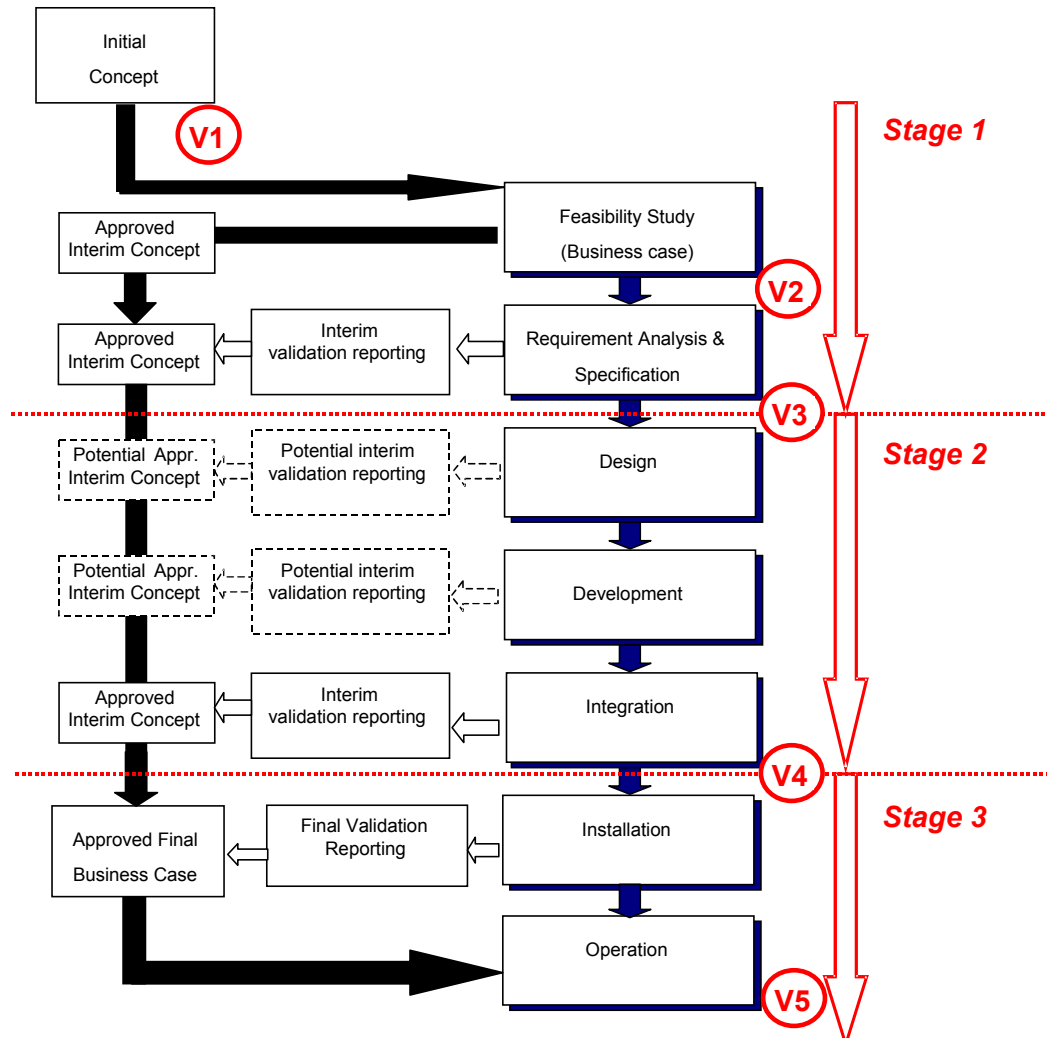
Concept Validation:

- **"The sequence of validation steps integrated into the concept development process by which 'individual instantiations' are validated, and through which the necessary understanding to mature the concept is gained."**

Validation During Concept Development

The strategy highlights…

- **3 stages of the development process**
  - **Stage 1:** Development of the operational concept specifications.
  - **Stage 2:** System procurement phase.
  - **Stage 3:** Pre-operational and operational phases.
- **5 important transition milestones**
  - **V1:** Observation, reporting, and agreement on the basic principles of a new concept;
  - **V2:** Initial proof of concept through model or early prototype;
  - **V3:** Full specification of concept, pre-operational demonstration;
  - **V4:** Production, integration, and verification of components (factory acceptance); and
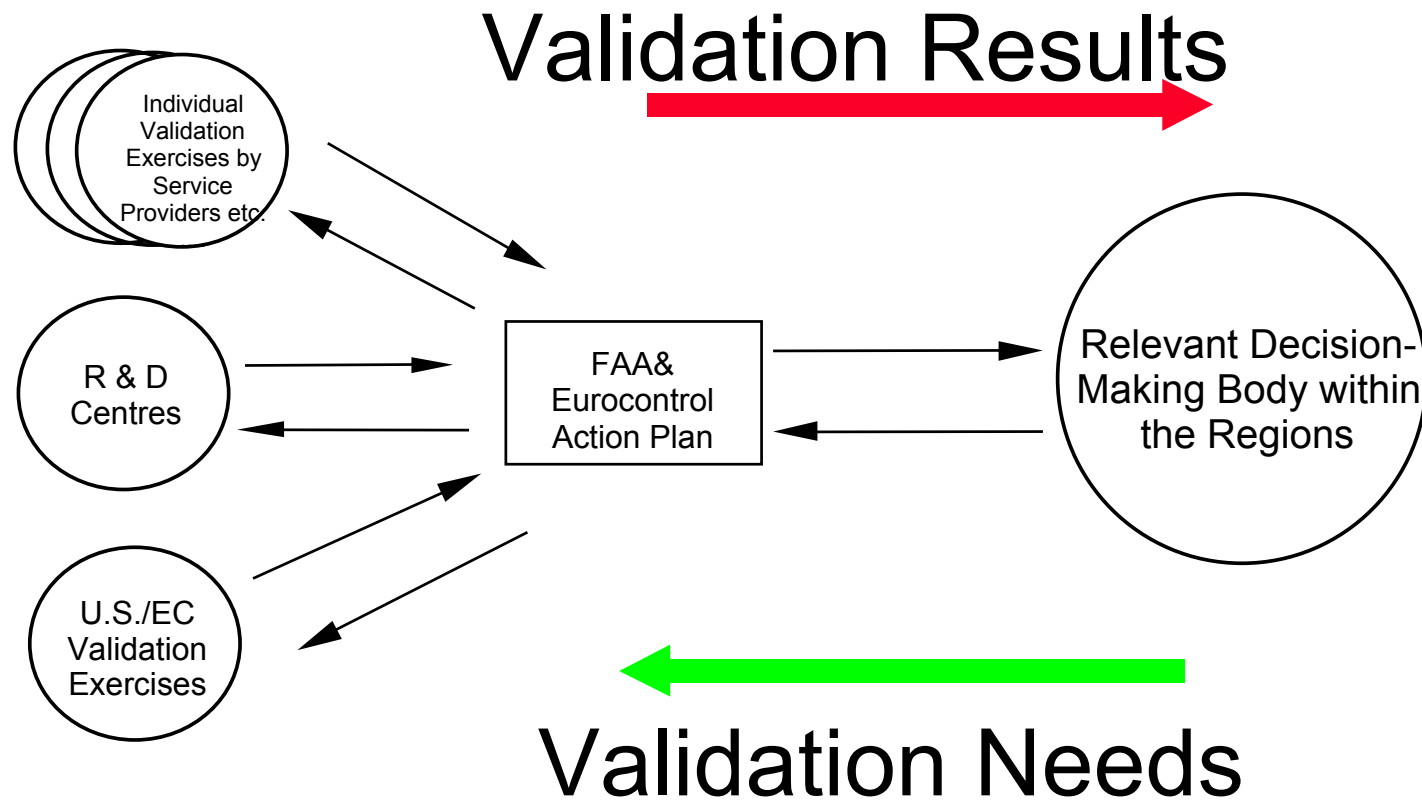 - **V5:** Sign-off for operation through on-site formal validation.

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The Concept Development Validation Process

Operational Concept Validation Principles

- **An agreed overall validation plan for the different concept developments in order to avoid redundancies and to control the progress of work,**

- **Common methodology,**

- **Common ATM performance objectives,**

- **A tool to communicate all developments and results in a common structure: A shared Validation Data Repository (VDR),**

- **Organise the development and exploitation of the Validation Environment, and**

- **Create confidence for ATM users and providers.**

Overall Plan: AP5 within the Validation Structure

Validation Results

- Individual Validation Exercises by Service Providers etc.
- R & D Centres
- FAA& Eurocontrol Action Plan
- Relevant Decision-Making Body within the Regions
- U.S./EC Validation Exercises
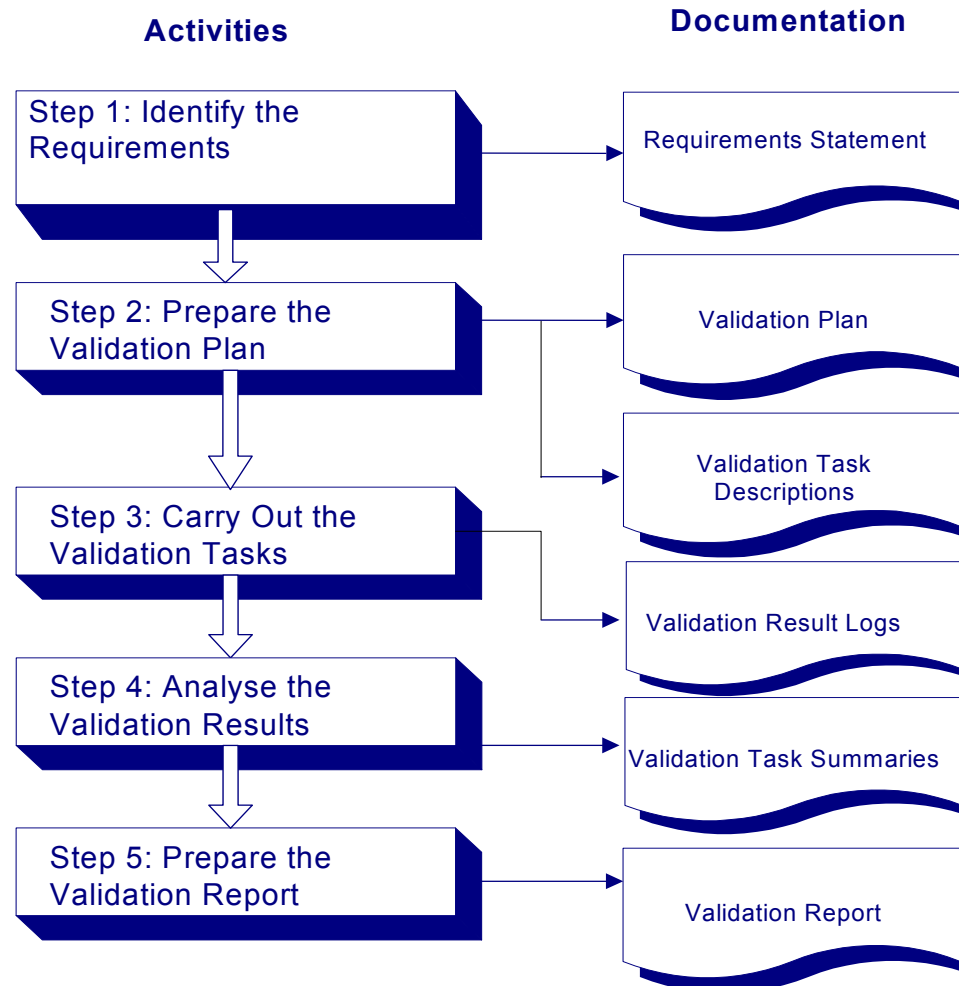
Validation Needs

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Common Validation Methodology

There needs to be consensus on the appropriate use of methodologies and the definition of what constitutes best practices.
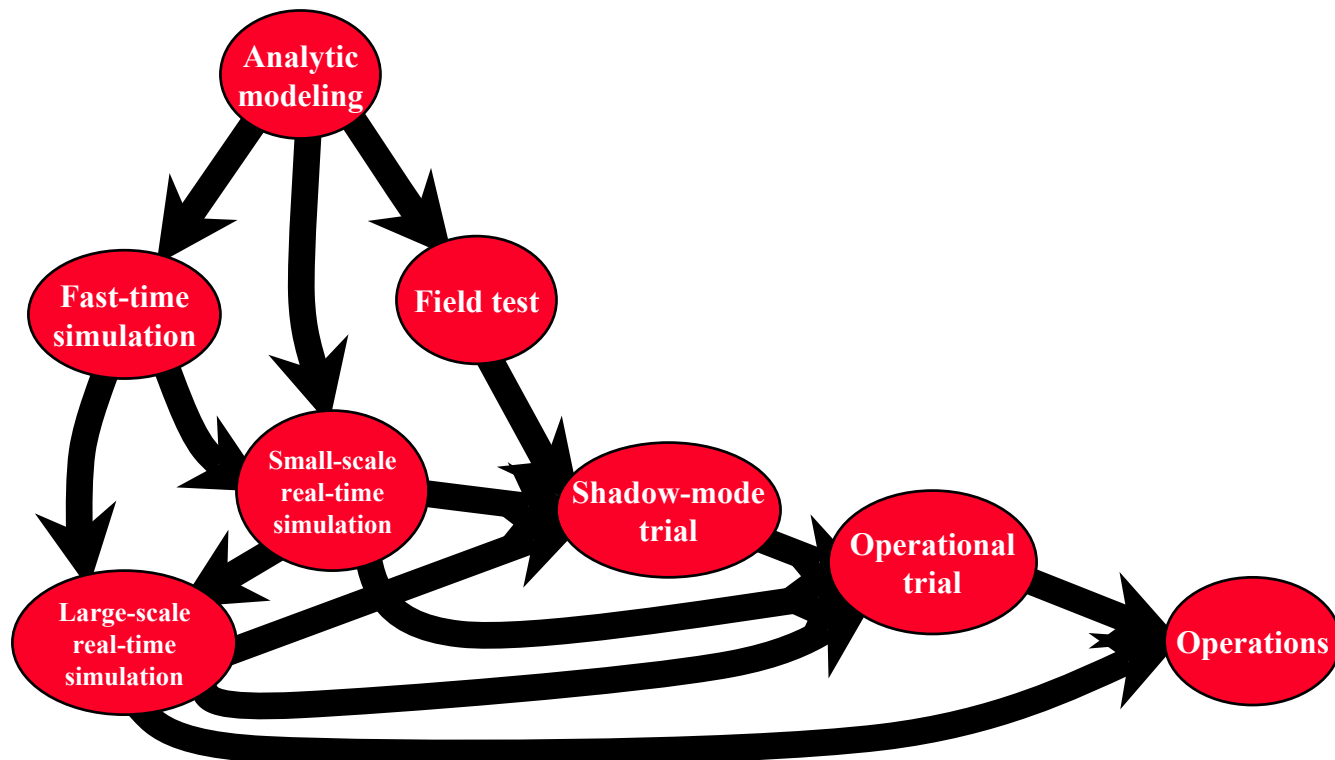
High Level Methodology Approach

Activities   **Documentation**

| Step 1: Identify the Requirements | → | Requirements Statement |

| Step 2: Prepare the Validation Plan | → | Validation Plan |

→ Validation Task Descriptions

| Step 3: Carry Out the Validation Tasks | → | Validation Result Logs |

| Step 4: Analyse the Validation Results | → | Validation Task Summaries |

| Step 5: Prepare the Validation Report | → | Validation Report |

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ATM Performance Objectives

Client Groups of Validation Data	Key ATM Performance CategoryObjectives	Sub Category
Airlines, ANS Providers, Supply Industry **Regulators** **Political Bodies** **Military** **Controllers, Pilots**	**Capacity**	Airspace Throughput
		Access
		Predictability
		Flexibility
		Airport Capacity
		Flight Efficiency
	Economics	Service Charges
		Equipment Costs
		Flight Efficiency
		Operating Costs
	Safety	Risk Identification
		Risk Classification
		Risk Management
		Risk Monitoring
	Environment	Gas Emissions
		Noise
	National Security	
	Operability	Usability
	Uniformity	Interface Standards

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Validation Data Repository (VDR)

Here it comes…

A-N-T-I-C-I-P-A-T-I-O-N…

Hold on to your seats…

Sorry, to be discussed later.

Validation Environment Goals

Provide all organisations with the capability of conducting validation activities in a *structured, collaborative* and *interoperable* way.

- To maximise the re-use and exchange of data between different groups involved in the validation process,
  - Use of common scenarios.
  - Data preparation.
- To maximise the re-use of data at different phases of the validation process, and
- To reduce development time by facilitating the integration of validation tools developed elsewhere.

Creation of Confidence

The conceptual reasoning behind the process of "validation" is described by the phrase "building confidence"

- **Describing the Validation Process**
  - **Explanation of the validation exercise characteristics to the audience as an integral aspect of any set of experiments or studies.**
- **Competency of the 'Validating Agency'**
  - **Demonstrate experience of successful use of the operational validation process.**
- **Marketing as a confidence-building tool**
  - **Focused on demonstration of careful planning and execution**
- **Demonstrated alignment or awareness of related ATM activities**
- **Involvement of key stakeholders**

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Conclusion

As Diana and Ulrich mentioned…

- **The workshops will fill in the details**

(to be added as appendices to the document).

Appendix- a 3 ½ inch-long tube of tissue that extends from the large intestine. The appendix contains specialized tissue that can produce antibodies, but no one is absolutely certain what its function is. One thing we do know: We can live without it, without apparent consequences.